

August 2002

ARM Facilities Newsletter

ANL/ER/NL-02-08



ARM in Australia

The Atmospheric Radiation Measurement (ARM) Program of the U.S. Department of Energy (DOE) has launched its newest Atmospheric Radiation and Cloud Station (ARCS) in Darwin, Australia. This is the fifth research site established since ARM Program inception in 1989. The new Darwin site and two other ARCS sites — on Manus Island and the island of Nauru — are in the Tropical Western Pacific region. The North American sites in the U.S. Southern Great Plains and on the North Slope of Alaska represent two different climate regions.



Figure 1. Attendees of the Darwin dedication ceremony (from left) included Tom Ackerman (Pacific Northwest National Laboratory), ARM Chief Scientist; Peter May and Christian Jakob, Australian Bureau of Meteorology scientists; Chuck Long (Pacific Northwest National Laboratory), Tropical Western Pacific Site Scientist; and Doug Sisterson (Argonne National Laboratory), ARM Operations Manager.

ARM Facilities Newsletter is published by Argonne National Laboratory, a multiprogram laboratory operated by The University of Chicago under contract W-31-109-Eng-38 with the U.S. Department of Energy.

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Figure 2. The location of the Darwin ARCS site.

A goal of the ARM Program is to improve understanding of (1) the ways clouds and atmospheric moisture interact with solar radiation and (2) the effects of these interactions on both a local and global climate. Years of collected data are being used to improve computer climate models so that their predictions are more accurate.

The new Darwin site is at the Darwin International Airport (Figure 2), adjacent to the Darwin Airport Meteorological Office. The site features state-of-the-art instrumentation (Figure 3) used to measure solar radiation and surface radiation balance; cloud parameters; and standard meteorological variables such as temperature, wind speed and direction, atmospheric moisture, precipitation rates, and barometric pressure.

A data management system (DMS) consisting of two

computer workstations collects, stores, processes, and backs up data from each of the ARCS instruments. Data are transmitted via the Internet to the United States for further processing and archiving with data from the other ARM sites. All ARM data are freely available via the Internet to the public and the worldwide scientific community (<http://www.arm.gov/>).

Operational since April 2002, the Darwin site was officially dedicated on July 30, 2002, by dignitaries from both the United States and Australia. The site is a collaborative effort between DOE and the Australian Bureau of Meteorology's Special Services Unit — the equivalent of the U.S. National Weather Service — which will handle daily operation. U.S. Secretary of Energy Spencer Abraham remarked, "Our collaboration with Australia in the establishment of this site represents an exciting expansion of the ARM Program and our ongoing quest to understand and predict the earth's climate."



Figure 3. Instrumentation located at the Darwin ARCS site.



Figure 4. Unveiling the site plaque for the new Darwin facility are Dr. Wanda Ferrell (left), ARM Program Director, and The Honorable Dr. Sharman Stone, Member of Parliament, Parliamentary Secretary to the Minister for the Environment and Heritage of Australia.

The five ARM Program research locations were chosen because of their varying and abundant cloud formations. More cloud types mean a more complete investigation. To the ARM collection, the Darwin site

adds data sets detailing interactions between a unique type of cloud and solar radiation. This addition represents another step toward the ARM goal of more accurate predictions from computer climate models.